Before the
Federal Communications Commission
Washington, DC 20544

In the Matter of

Amendment of Part 101 of the Commission's Rules To Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees	)	**WT Docket No. 10-153**
Request for Interpretation of Section 101.141(a)(3) of the Commission's Rules Filed by Aleatel-Lucent, Inc. et al.	)	**WT Docket No. 09-106**
Petition For Declaratory Ruling Filed by Wireless Strategies, Inc.	)	**WT Docket No. 07-121**
Request For Temporary Waiver of Section 101.141(a)(3) of the Commission's Rules Filed By the Fixed Wireless Coalition	)	

Comments of United States Cellular Corporation

United States Cellular Corporation ("USCC") hereby files its Comments on the Notice of Proposed Rulemaking released August 5, 2010 in the above-captioned docket ("NPRM"). USCC applauds the FCC's attempt to foster the more intensive use of microwave frequencies for backhaul and other purposes. USCC accordingly supports the expanded sharing of CARS and BAS spectrum in the 6875-7125 MHz and 1270-13200 MHz bands and the use of adaptive modulation for microwave systems in the 6 and 11 GHz bands as proposed in the NPRM. However, USCC continues oppose the use of microwave "side lobes" to create additional microwave paths.

Background

USCC is a wireless carrier serving approximately 6.1 million customers nationwide using CDMA technology. USCC makes extensive use of 6 and 10 GHz common carrier microwave facilities to link its base stations with each other and with USCC's switches. At present, USCC has approximately 2513 licensed common carrier microwave facilities. Accordingly, USCC has a considerable interest in any action the FCC may take to alter its Part 101 and other rules governing microwave service.

I. USCC Supports Expanded Use of Microwave Frequencies.

Paragraphs 6-9 of the NPRM briefly describe the process by which carriers secure regulatory consent to use Fixed Services ("FS") frequencies under Part 101 of the FCC's Rules. The NPRM then proposes making available an additional 750 MHz of spectrum for FS (NPRM ¶¶ 10-18) use in order to accommodate the increase in demand for wireless backhaul capacity. As is shown in the chart attached to Paragraph 13 of the NPRM, FS licensees already share certain frequencies with Broadcast Auxiliary Service ("BAS") and Cable Antenna Relay Serve ("CARS") licensees. Specifically, FS shares the 6425-6525 MHz, 13.2-13.25 MHz, 17.7-18.2 GHz and 19.3-19.7 GHz band with CARS and BAS. Frequency coordination procedures help to minimize interference concerns among these services.

The FCC is now considering allowing FS licenses also to share additional BAS and CARS spectrum. At present, there are three frequency bands below 13 GHz which are assigned to BAS and CARS, but not to FS. As is shown in the same chart, they are the 2025-2110 MHz, 6875-7125 MHz and 12700-13200 MHz bands. The FCC has tentatively concluded that the 2025-2110 MHz band would not be a good candidate for FS at this time, because BAS incumbents have only recently been relocated to that band from other bands. Instead, the FCC

has tentatively concluded that FS systems should be allowed to share the 6875-7125 MHz and 12700-13200 MHz bands. We agree with the FCC's tentative conclusion.

The 6875-7125 MHz band is adjacent to existing FS operations in the 6525-6875 MHz band and would be well suited for backhaul and other microwave applications. The FCC also proposes to allow FS systems to use the 12700-13200 MHz band (NPRM ¶ 16). This band, we believe, would also be well suited to short and medium length backhaul microwave applications. The band is mainly used by rural cable systems at present and is evidently not used as extensively as previously. The FCC stresses that it is not seeking to modify existing licenses held by CARS and BAS licensees in these bands. The FCC believes that new FS uses would be compatible with existing use through careful frequency coordination and we agree with that assessment.

The FCC also seeks comment on the best approach to "channelization" for the various bands under consideration. Paragraphs 18-20 of the NPRM discuss the existing channelization and other technical rules applicable to these bands. USCC does not make a channelization proposal at this time. However, we will review closely the channelization proposals made by other commenters and offer our comments on the various proposals in the reply round in this proceeding.

The FCC also proposes to apply the same technical rules that currently apply to the "upper" six gigahertz band held by FS licensees to the adjacent 6875-7125 MHz band because the bands are contiguous and should be able to use similar equipment. USCC agrees with that approach.

The FCC proposes to eliminate the so-called "final link" rule, which prohibits broadcasters now using FS frequencies from those using frequencies as the final radio frequency

(RF) "link" in the chain of distribution of program materials to broadcast stations. (NPRM ¶¶ 22-27). The purpose of this rule was to prevent broadcast stations from making excessive use of frequencies primarily licensed to FS services. However, in light of the fact that FS licensees would be able to use presently exclusive BAS and CARS frequencies, the FCC believes that broadcast licensees should be able to use FS frequencies for all purposes as well. USCC concurs that it would be reasonable to adopt this rule change, provided wireless carriers are granted access to the CARS and BAS frequency bands discussed above.

II. USCC Supports The FCC's Proposals with Respect To Adaptive Modulation.

In 2009, the Fixed Wireless Communications Coalition ("FWCC") asked the FCC to issue a declaratory ruling to allow FS licensees to maintain communications when adverse propagation characteristics would otherwise force those communications to be terminated.[1] Specifically, the FWCC proposed to allow FS licensees temporarily to allow data rates to drop below the minimum "payload" capacity requirements specified by the rules in certain limited circumstances. Under present rules, if data rates drop below the minimum capacity, the link goes completely out of service. FWCC argued that permitting a drop in data rates would reduce operational costs and improve efficiency and would facilitate wireless backhaul in rural areas. Fixed service links, especially long links, are subject to atmospheric fading, i.e. a temporary drop in received power caused by changes in propagation conditions. Fading leads to an increase in bit errors and sometimes to a complete loss of communications. One way to combat fading is by briefly reducing the data rate, which requires a temporary change in the type of modulation, a process called adaptive modulation. This may reduce the minimum payload capacity below the

[1] See, Request Filed on May 8, 2009 on behalf of Alcatel-Lucent; Dragonware, Inc.; Ericson, Inc.; Exalt Communications; The Fixed Wireless Communications Coalition; Harris Stratex Network; and Motorola, Inc. ("Request"). See also, Public Notice, "Wireless Telecommunications Bureau Seeks Comment on Request of Alcatel-Lucent, et al., for Interpretation of 47 C.F.R. et al. 101(a)(3) To Permit The Use of Adoptive Modulation Systems, W.T. Docket 09-160, DA 09-147, released June 25, 2009.

value specified in the rule for a short time although this would obviously be better than a "zero" rate. FWCC argued that fading conditions that might trigger adaptive modulation occur under 1% of the time.

USCC supported the FWCC request, arguing that it would provide for more efficient overall usage of the spectrum. USCC agreed with FWCC that, overall, adaptive modulation would result in gains in "throughput," by allowing for handling of traffic when a link would otherwise be inoperative. However, Verizon and other commenters disagreed, arguing that: (1) adaptive modulation was inconsistent with the underlying purpose of the rule and should not be adopted; and (2) that such a change in licensee practices could not be adopted by means of declaratory ruling. The FCC has now agreed that a rulemaking to is necessary to implement the policy change sought by FWCC. Accordingly, the FCC has now included the FWCC proposal for public comment in the NPRM (Paragraphs 28-40). The Commission has also proposed a modified approach to adaptive modulation, which is set out in Paragraphs 38 and 39, to ensure that a minimum "payload" capacity must be met at all times, except during anomalous signal fading. The FCC also proposes to require that licensees wishing to employ adaptive modulation must note that fact in the prior coordination process.

USCC believes that the FCC should adopt these safeguards, but still strongly supports the basic principle of adaptive modulation, for the following reasons, which should not be lost in the debate over how best to maintain payload capacity. By permitting a lower data rate at the appropriate times, links will not automatically go out of service, thus preserving some service when otherwise there would be no service at all for some period of time. We believe that to allow carriers to make this adjustment would make sense and would serve the public interest. Moreover, we also believe that adaptive modulation might also permit reduced tower loading,

allow for smaller antennas, and reduce the need for backup "diversity" antennas which systems sometimes employ to ensure continuous service. Thus, owing to these internal improvements in microwave system efficiency, carriers might also be able to allow additional collocations on their towers and thus provide additional service to the public. In short, the proposed rule change makes sense and will serve the public interest.

III. USCC Still Opposes The WSI Proposal.

As discussed in the NPRM (¶¶ 41-58), the FCC also seeks comment on the request for declaratory ruling filed by Wireless Strategies, Inc. ("WSI"), now recast as a petition for rulemaking.[2]

In its Request, WSI asked the Commission to issue a declaratory ruling confirming that an FS licensee would be permitted simultaneously to coordinate multiple links whose transmitter elements collectively complied with the Commission's antenna standards and frequency coordination procedures.[3] WSI's original proposal would have permitted terrestrial FS licensees to deploy additional links within the maximum allowed radiation power envelope ("RPE") of a licensed link without prior coordination or authorization.[4]

USCC agreed with the majority of commenters in the WSI proceeding and strongly opposed the WSI Request. Contrary to WSI's contentions, FS licensees do frequently utilize the spectrum located within a transmitter's side lobes. In addition, WSI did not demonstrate that its proposed approach would comply with the Part 101 frequency coordination rules. Implementation of the WSI proposal would have greatly increased the risk of harmful

[2] Wireless Strategies, Inc. Request for Declaratory Ruling on Compliance of Fixed Microwave Antennas Having Distributed Declaratory Elements, WT Docket No. 07-121 (filed February 27, 2007) ("Request" or "WSI Request").
[3] WSI Request, p. 1.
[4] *See* Comments of Mobile Satellite Ventures Subsidiary LLC and TerreStar Networks, Inc., Wt Docket No. 07-121, p. 1 (filed July 19, 2007).

interference to other fixed microwave facilities, such as those owned by USCC.[5] If WSI's Request had granted, WSI would also have pushed the outer limits of the Part 101 antenna performance and power level requirements to create area-wide licenses in violation of both the letter and spirit of the Commission's rules and licensing policies.

In the NPRM, the FCC has sought to meet those objections by requiring that: (1) "auxiliary" microwave stations must not cause any "incremental" interference to other primary links; (2) auxiliary stations will be secondary in status and have no right to claim interference protection from any primary stations; (3) auxiliary stations would have to be coordinated in advance with other licensees and would have to be the subject of major modification applications; and (4) auxiliary stations could not communicate with each other but only with the "primary link" transmitter or receiver. Auxiliary stations would not be subject to otherwise applicable antenna standards, loading or minimum path length requirements, but would be subject to NEPA and historic preservation requirements.[6]

USCC recognizes that the FCC has sought to allay the interference concerns of FS and satellite licensees, but still believes that the construction of hundreds of microwave facilities within the side lobes of existing licensed facilities, even after frequency coordination, could only have the primary effect of increasing harmful interference to present licensed facilities. USCC is especially concerned with the potential for increased interference which could be created by the return paths of the newly created authorizations, which would preclude the licensing of many new full service FS facilities. Thus, at present, USCC continues to oppose this proposal, but will review the detailed comments describing proposed interference protections likely to be filed by proponents of the side lobe proposal.

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[5] As noted above, USCC has over 2,500 microwave licenses in the Fixed Service bands.
[6] NPRM, ¶¶ 51-52.

IV. USCC Opposes Modifying Microwave Efficiency Standards In Rural Areas But Is Open To Modifying Antenna Size Requirements.

The FCC has also issued a Notice of Inquiry ("NOI") on microwave issues, which is attached to the NPRM, (NOI, ¶¶ 59-68). USCC wishes to comment on two of the issues discussed in the NOI.

Under current rules, rural microwave licensees must offer the same bandwidth capacity as carriers in more densely populated metropolitan areas. The underlying purpose of the rule is to promote efficient frequency use. However, the Wireless Bureau has historically granted waivers to licensees in rural and remote areas where operation of microwave facilities meeting the efficiency standards would cause financial hardship. As is explained in Paragraph 61 of the NOI, by offering less capacity in rural areas, a licensee can use less power or is able to lengthen its microwave path. The FCC asks whether this waiver policy should be reflected in the rules so that rural applicants can automatically obtain less efficient but less costly facilities for backhaul without the cost and delay involved in having to seek the waiver of the rules.

USCC is sympathetic to the idea of promoting rural service, but must oppose any reduction in the efficiency standards applicable to any microwave facility, especially given the vast increases in demand which are occurring and will occur owing to the growth in data services. The existing waiver process offers a reasonable approach for carriers facing financial hardship or which are otherwise unable to comply with the standards.

The FCC also seeks a review all of all those Part 101 antenna standards dealing with antenna size. (NOI, ¶¶ 64-67). One proposal is to allow the use of smaller antennas. The FCC has generally preferred larger antennas, as they are more efficient transmitters of radio frequency energy than smaller antennas. However, the Commission notes that smaller antennas can be

beneficial in some ways, as they cost less to manufacture and are less expensive to install and maintain.

USCC endorses a review of the microwave antenna standards, particularly as applied to the 6 GHz band. Tentatively, USCC believes that amending the rules to reduce minimum antenna sizes might be beneficial in that it would reduce the burden of structural "loading" on antenna support structures. This would have various beneficial effects. Some of those effects are summarized in the NOI, at ¶ 66. An additional positive effect would be the facilitation of antenna collocation. The FCC can and should foster collocation of microwave and other antennas on existing towers, as the demand for wireless services is increasing constantly, even as the process of obtaining necessary regulatory approvals to construct wireless towers becomes ever more difficult. If reducing permissible antenna sizes will promote more intensive use of existing antenna towers, that is an important reason why it should be considered.

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Conclusion

For the foregoing reasons, USCC supports amending the FCC's Rules to permit expanded sharing of CARS and CARS spectrum and "adaptive modulation" of microwave signals. USCC continues to oppose, however, the "auxiliary" use of microwave spectrum. With respect to the NOI, USCC opposes amending the FCC's Rules to permit less efficient antennas in rural areas, while supporting a review of permissible antenna size standards.

Respectfully submitted,

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